

Handgrip for a skiing, walking or skating pole, and handstrap attached thereto

5 The invention relates to a handgrip for a skiing, walking or skating pole and to a handstrap attached thereto, comprising a strap section, which encircles the back and lower edge of a hand and connects, by way of transmission straps extending under the palm and the base of the thumb, to the handgrip, which is provided with at least one slot for the passage of the transmission straps and with a clamping element above the slot inside a top end of the
10 handgrip, whereby the runs of the transmission straps inside the top end of the handgrip are attachable in such a way that the length of the transmission straps is adjustable.

15 This type of handgrip-handstrap assemblies have been manufactured and sold for several years by the Applicant as well as other manufacturers. A benefit is the easy length adjustment of transmission straps, whereby the crotch between the thumb and the index finger is brought to the proximity of a fulcrum between the pole and the hand. Also, the transmission of force preferably occurs in a way similar a traditional strap, such that the force is
20 conveyed from the back of the hand around the thumb base and the lower edge of the palm to transmission straps present on the palm side.

Patent publication EP-0357517 discloses a combination handstrap and glove, wherein the handstrap comprises a wrist-enclosing cuff, provided with a
25 projection which extends below the palm edge and connects by way of a palm-side transmission strap to a clamping element, which is present in the crotch between the thumb and the index finger and by means of which the combination handstrap and glove can be released from the handgrip as desired. Between the clamping element and the wrist-enclosing cuff there is
30 a control strap on the backhand side, which has a function of retaining the clamping element in the crotch between the thumb and the index finger even

if the grip of a hand is completely released from the handgrip. However, this type of control strap involves drawbacks as well. In the event of a fall, the strap binds the thumb too much and precludes a protective movement. Releasing the hand from the handgrip is very awkward without a quick-release coupling. Even the quick-release coupling requires an unlocking action before the hand can be released from the handgrip for other activities. The strap system, provided with a control strap, presses and squeezes the hand and impedes circulation, or else it must be made too slack for proper Nordic skiing. The clamping element present in the crotch between the thumb and the index finger interferes with the use of a hand for other activities after releasing it from the handgrip. The clamping elements also hamper a length adjustment of the strap system for hands of various sizes. The wrist-enclosing cuff is in a wrong position, on the wrong side of the wrist joint, such that there is no strap section in the backhand area taking up the force developed during a propulsion cycle.

In a combination handgrip-handstrap of the above type, which has become known through use, the transmission straps are inserted inside the top end of a handgrip through a single slot present in the back of the handgrip. Thus, the fulcrum of transmission is set at a small distance from the centre axis of a pole and the transmission straps apply stress over a narrow zone on the crotch between the thumb and the index finger. This downside exists also in the solution disclosed in patent publication EP-0357517. The latter involves a further drawback in that the skier cannot choose his or her gloves according to hand size and/or weather but, instead, is forced to settle with a glove fitted with transmission straps and clamping elements. Of course, the range and supply of such gloves is not equal to ordinary gloves in terms of versatility and availability.

Patent publication US-4,775,168 discloses a combination handgrip-strap, wherein the ends of a handstrap are mounted by means of pivoted axles on

the opposite sides of a handgrip. The length adjustment for the transmission straps of a handstrap is assigned to a strap section intended for the backhand side, which is a solution considerably more unreliable than the length adjustment of transmission straps involving the clamping elements of a handgrip and which also limits a handstrap in terms of its ergonomically widened design. Anyway, the design of a handgrip is intended for alpine skiing and poorly adapted to Nordic skiing, one of the reasons being that the mounting axle for the ends of the handstraps is located too close to the top end of the handgrip, the shaping of its rear portion as a rearward facing lip being unfit for Nordic skiing, since the pole turns, during a backswing motion of the arm, to constitute a straight extension of the arm.

It is an object of the invention to further improve a combination handgrip-handstrap of the above type for eliminating the drawbacks associated with the above prior art solutions. A particular object of the invention is to ensure an effective transmission in skiing exercise and a close control over the handgrip also during a return motion, while ensuring a quick and easy release of the hand from the handgrip as desired.

This object is achieved by the invention on the basis of the characterizing features set forth in the appended claim 1. Preferred embodiments of the invention are disclosed in the dependent claims.

When there is no backhand-side control strap between the thumb and the index finger and the knob of a handgrip is designed ergonomically to remain in the hold of a hand throughout a skiing exercise, the ensuing benefits include e.g. as follows

- a preclusion of injuries in the event of a fall as the hand can be released immediately from the handgrip for a protective action
- an immediate release of the hand for action, e.g. during a biathlon event or beverage ingestion, without disrupting the athletic performance

- if properly fitted, a strict control over the pole, even during a return motion, without an unnecessary, straining, extra control strap, thus allowing, in the extreme backward position, an unimpeded opening of the fingers to discourage stiffness and to improve circulation in the hand
- 5 - a liberation of the entire hand for equipment repairs during a competition event without having to remove/dismantle the strap system or without having to use one hand for unfastening a separate locking system
- a continuous physical attachment of released poles by virtue of wrist straps without having to worry about the presence thereof, and provision
- 10 of a quick renewed hold of the handgrip
- a liberation of both hands from holding the poles, which means that one hand can be used e.g. for holding a beverage container while opening its cover with the other hand.

15 Two exemplary embodiments of the invention will now be described in more detail with reference to the accompanying drawings, in which

- fig. 1 shows a combination handgrip-handstrap for the right hand in a view from the left-hand side;
- 20 fig. 2 shows the combination handgrip-handstrap of fig. 1 in a view from the right-hand side, slightly obliquely from the back;
- fig. 3 shows the same combination handgrip-handstrap for the right
- 25 hand in a view from the front; and
- fig. 4 shows the same combination in a view obliquely from the back; and
- 30 fig. 5 shows the same combination in a view from above.

- fig. 6 shows a combination handgrip-handstrap according to a second embodiment of the invention, which is intended for holding by the right hand, in a view from the left-hand side; and
- 5 fig. 7 shows a handgrip for the combination of fig. 6, wherein its knob element 21 is cut away and released to a position which enables the length adjustment of transmission straps.

A handgrip 1 is fitted with a handstrap 2, comprising a strap section 3, 15 encircling the back and lower edge of hand, which connects to the handgrip 1 by way of transmission straps 4, 5 extending under the palm and the thumb. The handgrip is provided on its opposite side surfaces with slots 6, 7, which decline obliquely downwards on the way towards the back of the handgrip. The transmission straps 4, 5 are inserted inside a top end of the
15 handgrip through the slots 6, 7.

Above the slots 6, 7 inside the top end of the handgrip lies a wedge-like clamping element 8, whereby the runs of the transmission straps 4, 5 through the top end of the handgrip are attachable between the side walls of
20 the clamping element 8 and a recess present in the top end of the handgrip 1. The strap runs have ends 4a, 5a thereof emerging from the top end of the handgrip and attached together for a closed loop to be grasped by a finger when it is desirable to pull the clamping wedge 8 up for a length adjustment of the transmission straps 4, 5. The length of each strap run 4, 4a and 5, 5a
25 is individually adjustable, whereby a proper position of the handstrap around both the thumb and the palm can be precisely adapted to hands of various sizes, even such that the thickness variation of a ski glove can be anticipated.

Between the slots 6, 7 there is a small vertical drop, which is within the
30 range of 3-20 mm. This vertical drop can be used for finding optimal ergonomics for fulcrums between the palm's upper edge and the thumb's

lower edge as the palm rotates off the handgrip while the propulsion still continues.

The handgrip 1 is provided with a reduction 14, the slots 6, 7 being located
5 in the region thereof, such that the handgrip's most reduced or thinnest part lies immediately in the region of the slots 6, 7 or slightly therebelow. This design promotes both transmission and pole control in various phases of motion. Above the slots 6, 7, the handgrip's knob-like top end rises to a considerable height and its back 10 inclines vigorously forward. The
10 significance of this design is described more closely in the Applicant's patent publication US-4,288,101. In the backswing phase of a pole, as the grip of a hand releases from the handgrip, the handgrip's back surface present above the transmission straps bears against the side of a hand above the crotch between the index finger and the thumb. This provides a good control feel
15 for the pole, and the force of a return movement need not be transmitted by means of an extra control strap. The prior known solutions have been provided with a backhand-side control strap for ensuring that, as the return motion of a pole continues, the handgrip is guided to the hand, even if the squeezing grip of the hand were delayed. The control strap does not have an
20 actual transmission function. In the present invention, the knob-like portion of the handgrip's top end is designed ergonomically in such a shape that it remains in the grip of a hand throughout a skiing exercise, even during a return motion. The handgrip section above the slots 6, 7 is designed in an upward direction as a laterally and forward expanding knob 9, which is
25 provided with the forward curving back surface 10 with a height of at least 3 cm. Thus, the knob's lip-like expansion 9 extends not only forward but also on both sides for securing for the same a firm hold in the crotch between the thumb and the index finger, which crotch keeps closing automatically as the return motion of a pole continues forward from the extreme backward
30 position. In the extreme backward position, the fingers can be completely opened if the transmission straps 4, 5 are adjusted to a proper tension.

- When the pole constitutes an extension to the back-extended arm, the back surface 10 bears against the crotch between the thumb and the index finger adjacent to the back of the hand, whereby the pole remains in the hold of a hand without any squeezing by the fingers. The significance of the knob's lateral extensions does not become apparent until the return motion continues, as the hand begins automatically to squeeze towards a gripping posture. Thus, the expanded knob secures itself between the thumb and the index finger well before the angle between the hand and the pole changes to such a degree that the handgrip would fall through, were it supported by straps alone. The significance of the forward directed knob 9 becomes evident as the forward return motion continues. At this point, the fingers curl around the handgrip, but no squeezing grip is not needed for keeping the pole under control.
- 15 The thinnest section may have its thickness within the range of 17-22 mm and, respectively, the expanded knob may have its width within the range of 25-32 mm. Typically, the widening is 20-50%, preferably at least 25% or 30%, e.g. about 30-35%.
- 20 Hence, the knob design has made it possible to eliminate a backhand-side control strap, whereby all transmission straps 4, 5, which are directly attached to a handgrip, extend on the palm side, i.e. the back of the hand is completely free of straps attaching directly to the handgrip.
- 25 The strap section 3, 15, which encircles the back of a hand, has its ends connected by a an elastically extensible wrist strap 12, which holds the transmission straps 4, 5 and the strap section 3, 15 in position around the hand. The strap sections 3, 12, 15 constitute together a closed link, which surrounds the hand, specifically the back of a hand and the wrist on the palm side. The strap section 3, which is to lie under the lower edge of a hand and to partially cover the back of the hand, has a generally triangular outline in
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the embodiment of figs. 1-5. The foremost apex of the triangle finds a position under the lower edge of the palm. The strap 5 is attached to the palm-facing side of the triangle. The transmission strap 4, extending under and around the thumb base, is attached to one apex of the triangle design in the backhand area.

The wrist strap 12 has its buckle 13 attached to the strap section's 3 triangle design at its rearward apex to be positioned under the wrist. The wrist strap 12 is able to slide through the buckle 13 for adjusting the wrist strap in terms of its length and tightness. The wrist strap 12 has its free end attachable by a self-adhesive attachment 11 to the strap section 15 enclosing the back of a hand.

As best shown in fig. 2, the transmission strap 4, extending around the thumb base, and the wrist strap's 12 base end section lie in an overlap relationship in the area, which constitutes the strap section 15 partially enclosing the back of a hand. Thus, the straps 4 and 12 make an overlap at a V-angle, and the V-apex connects to one appropriately widened corner of the triangular portion 3.

In practice, the straps 4 and 5 are sections of a single strap, which constitutes a traditional strap link around the back of a hand. The strap section 3 is attached to this strap link. The wrist strap 12 and the backhand-encircling strap section 3, 15 constitute a closed ring or loop, the length of which is adjustable by means of the wrist strap 12 and which loop is quickly extensible by means of the wrist strap 12 for allowing an unimpeded threading of the hand therethrough.

The inclined slots 6, 7 have an angle relative to horizontal plane lies within the range of 10°-40°, preferably within the range of 15°-30°. The handgrip extends at least 2,5 cm, preferably about 3-3,5 cm, above the slots 5, 6. At

the same time, this provides a space for a sufficiently long clamping wedge 8, the strap runs lying on either side thereof. The slots 6, 7 are located slightly closer to the handgrip's rear side than its front side. However, transmission from the straps 4, 5 to the handgrip takes place in the
5 sufficiently close proximity of the centre axis of a pole, on either side thereof, in order to reduce a bending load applied to the pole.

The following description refers to the embodiment of figs. 6 and 7 as far as it differs from that of figs. 1-5 as described above.

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The strap section 3, which surrounds the lower edge of a hand and partially the back of a hand, is designed in a rectangular outline and provides an extended cushion attached to a strap link, which is constituted by the transmission straps 4, 5 and which in turn constitutes a part of the
15 backhand-encircling strap section 15. The wrist strap 12, which is attached at one of its ends to the strap section 15, constitutes a single link, the other end of which has its inner surface provided with a self-adhesive tape 12a which is attachable to a self-adhesive tape 11 lying on the outer surface of the backhand-encircling strap section 3, 15. In this embodiment, like in the
20 embodiment of figs. 1-5 as well, the backhand-encircling strap section 3, 15, on the one hand, and the wrist strap 12, on the other hand, constitute together, as extensions of each other, a closed loop which surrounds a hand and maintains a pole hanging from the transmission straps 4, 5 in contact with the hand, even when the hand has released its hold of the handgrip for
25 other activities.

Fig. 7 illustrates a novel and special attachment system for the transmission straps 4, 5. From the top end of the handgrip's 1 housing element rises a fastening plug 16, surrounded by a hollow knob element 21 which is
30 releasable to a position allowing a length adjustment of the transmissions traps 4, 5 (shown in fig. 7 without transmission straps). The fastening plug

16 has its side surfaces provided with studs 17, the transmission straps 4,5 being pressed thereagainst by the inner walls of the hollow knob 21 having the ends 4a, 5a thereof emerging from the top end of the knob's 21 cavity 25.

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In the present case, the fastening plug 16 is divided by two lengthwise slits 18 into two flexible tongues 23, 24. The tongue 23 is provided with a serration 22 which abuts a serration 20 present in the bottom edge of the knob's 21 cavity 25 and thus prevents disengagement of the knob 21.

- 10 However, the knob 21 can be removed, e.g. for the replacement of a damaged handstrap, by bending the tongues 23, 24, such that the serrations 20, 22 pass by and miss each other. In order to avoid having to choose a plastic material for the handgrip 1 in accordance with the elastic properties of the tongues 34, 24, the lengthwise slits 18 are provided with members 19
- 15 made a resilient material, such as rubber.

- Another feature common to both embodiments is that underneath the slots 6, 7, present in the handgrip's 1 side surfaces, there are shallow depressions 26 for embedding the transmission straps 4, 5 substantially flush with the
- 20 handgrip's surface in the reduced gripping area 14 of the handgrip 1.